

**CLAIMS.**

1. A method for preparing an heterogenised catalyst component comprising the  
5 steps of:
  - a) providing a halogenated precursor component of formula (I)
$$-\text{X}-[\text{CH}_2]-\text{CH}_3 \quad (\text{I})$$
  - b) reacting the halogenated precursor with an ionic liquid precursor in a  
10 solvent to prepare an ionic liquid;
- IL<sup>+</sup>X<sup>-</sup>  
c) optionally, reacting the intermediate IL<sup>+</sup>X<sup>-</sup> with a salt C<sup>+</sup>A<sup>-</sup>, wherein C<sup>+</sup> is a cation that can be selected from K<sup>+</sup>, Na<sup>+</sup>, NH<sub>4</sub><sup>+</sup>, and A<sup>-</sup> is an anion that can  
15 be selected from PF<sub>6</sub><sup>-</sup>, SbF<sub>6</sub><sup>-</sup>, BF<sub>4</sub><sup>-</sup>, (CF<sub>3</sub>-SO<sub>2</sub>)<sub>2</sub>N<sup>-</sup>, ClO<sub>4</sub><sup>-</sup>, CF<sub>3</sub>SO<sub>3</sub><sup>-</sup>, NO<sub>3</sub><sup>-</sup> or  
CF<sub>3</sub>CO<sub>2</sub><sup>-</sup>.
- d) using the ionic liquid prepared in step b) to heterogenise a metallocene component of formula (II)
$$\text{R}'' (\text{CpR}^m) (\text{Cp}'\text{R}^n) \text{M Q}_2 \quad (\text{II})$$
wherein Cp and C'p are independently selected from substituted or unsubstituted cyclopentadienyl groups M is a metal selected from Group 4 of the Periodic Table, R'' is a structural bridge imparting stereorrigidity between Cp and Cp' and Q is a halogen or an alkyl having from 1 to 12  
20 carbon atoms and wherein the amounts of ionic liquid and catalyst components are in a molar ratio (ionic liquid)/(catalyst component) of from 5:1 to 1:5;
- e) heterogenising the ionic liquid/metal system by addition of an apolar solvent inducing the precipitation reaction;
- 30 f) retrieving a metallocene catalyst component heterogenised by an ionic liquid.

2. The method of claim 1 wherein the ionic liquid precursor is N -alkyl-imidazolium or pyridinium.
- 5 3. The method of claim 1 or claim 2 wherein the ionic liquid and the catalyst component are in stoichiometric amounts.
4. The method of any one of claims 1 to 3 wherein the solvent used in steps b), step c) and step d) is selected from THF, CH<sub>2</sub>Cl<sub>2</sub> or toluene.
- 10 5. The method of any one of the preceding claims wherein the metallocene catalyst component is selected from a bis -indenyl, a bis-benzindenyl or a bis-tetrahydroindenyl, substituted or unsubstituted.
- 15 6. A catalyst component heterogenised by an ionic liquid obtainable by the method of any one of claims 1 to 5.
7. A catalyst system heterogenised by in an ionic liquid comprising the catalyst component of claim 6 and an activating agent.
- 20 8. The catalyst system heterogenised by an ionic liquid of claim 7 wherein the activating agent is methylaluminoxane and wherein Q is a halo gen.
- 25 9. The catalyst system heterogenised by an ionic liquid of claim 8 wherein the amount of methylaluminoxane is such that the Al/M ratio is of from 100 to 1000.
10. A method for homopolymerising or copolymerising alpha -olefins that comprises the steps of:
  - 30 a) injecting the catalytic system heterogenised by an ionic liquid of any one of claims 7 to 9 with an apolar solvent into the reactor;

- b) injecting the monomer and optional comonomer into the reactor;
- c) maintaining under polymerisation conditions;
- d) retrieving the polymer.

5 11. The method of claim 10 wherein the apolar solvent is n -heptane.

12. The method of claim 10 or claim 11 wherein the monomer is ethylene or propylene.